Quebec's billion-dollar answer to the Montreal problem

March 10, 1980

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NW: Good track pays off at the bottom line

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RAILWAY AGE

USPS 449-130
March 10, 1980 • Vol. 181, No. 5

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other subscribers in the U.S. possessions, Canada and Mexico: $19 one year; all other countries $35 one year. All subscriptions payable in advance. Single copies $1 except special issues. Copyrighted © 1980.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010. Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

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Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT. POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

WHERE EFFICIENCY BEGINS

"The gospel according to Jack Fishwick," *Railway Age* observed a couple of years ago in an article on Norfolk & Western and its president, "can be summed up in two words: efficiency, productivity." The further point may now be made that on NW, efficiency begins with well-maintained track, and the people who maintain that track are as conscious of productivity measurement as are, for example, the people over in car utilization. It is a point of pride with Chief Engineer L. A. "Buck" Durham, Jr., for example, that a system rail gang today, while operating with 16% less manpower than in 1972, can nonetheless put 30% more rail in place for each on-track hour. NW's maintenance philosophy is described in the story beginning on p. 18.

BUT CAN YOU PROVE IT?

"You *say* rail transit is the most energy efficient way to move people—but can you prove it?" That question is often put to us. Now, the American Public Transit Association has made it an easy question to answer. APTA's just-published 1978-1979 edition of the Transit Fact Book contains the following table:

Propulsion energy required to move 200 commuters 10 miles in line-haul service

Type of vehicle	Passengers per vehicle	Number of vehicles	Btu* per passenger mile	Total Btu*
Heavy rail car	200	1	103	205,060
Heavy rail car	100	2	205	410,120
Transit bus	67	3	517	1,040,250
Transit bus	40	5	867	1,733,750
Vanpool	10	20	1,389	2,777,800
Vanpool	6	33	2,314	4,583,370
Carpool	4	50	2,224	4,484,000
Average automobile	1.3	154	6,898	13,810,720

*British thermal units

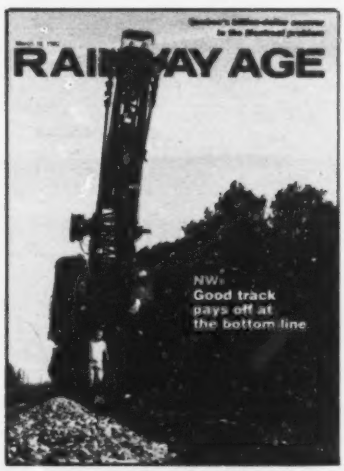
With the table, there is this comment: "During peak periods when crush loads are experienced, transit buses are up to 15 times more energy efficient than automobiles, achieving 280 passenger miles per gallon of fuel compared to the 19 passenger miles per gallon achieved by the average commuter automobile. A modern heavy rail car capable of carrying over 250 passengers at a maximum load is the most fuel efficient form of urban transportation. Under these fully loaded conditions a heavy rail car is 53 times more fuel efficient than an average commuter automobile."

The reply to this, of course, is that the most energy efficient system in the world is grossly inefficient unless people use it—people who would otherwise be driving their cars to work. APTA has something to say about this, too: "A licensed driver in Chicago, a city with extensive rail and bus service, purchases 6.8 gallons of gasoline per week. In Washington, D.C., where rail service has only been in operation since 1976, the average purchase is 8.2 gallons a week; and in Los Angeles and Houston, cities where transit has been small but is now growing rapidly, the average gasoline purchase per driver is 14.0 and 16.2 gallons per week, respectively." APTA's conclusion: "As transit systems increase in capacity and begin to affect the way cities grow, there will be fewer cities where there is a high demand for gasoline."

RAILWAY AGE

March 10, 1980

FEATURES



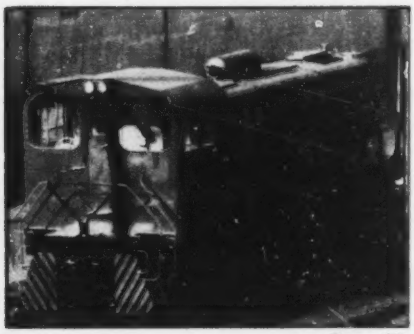
Cover article, page 18

18 NW: Good track pays off at the bottom line
"Buck" Durham's engineering team has posted notable gains in both the productivity of NW's maintenance-of-way forces and their efficiency in getting on track, getting the job done, and getting off again.

25 Industrial car movers: New power in an old package
Outside, they resemble switching locomotives, but inside, the power and controls are tailored to industrial rather than traditional railroad needs.

28 Moving people: A billion-dollar solution for Montreal
The Province of Quebec's plan calls for, among other things, a whole new level of intermediate service over 38.5 miles of existing rights-of-way.

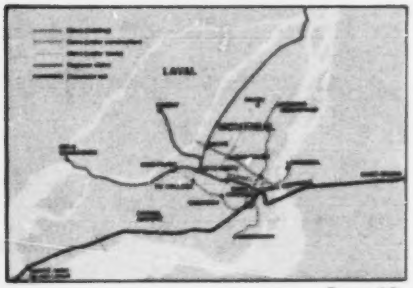
42 South Shore: New life for the last of the interurbans
Often down—and for a time, last year, out—the CSS&SB is now getting significant operating aid and will soon have a new fleet of cars.



Page 25

NEWS

6 Short and Significant
11 Amtrak: $200 million for cars, locomotives
11 Adirondack Ry. an Olympics "winner"
12 Transit braces for a funding fight
14 Milwaukee shrinks; the Rock hangs on
16 USRA: "What if?" report on Conrail
55 The Railroad Market



Page 28

COMMENT

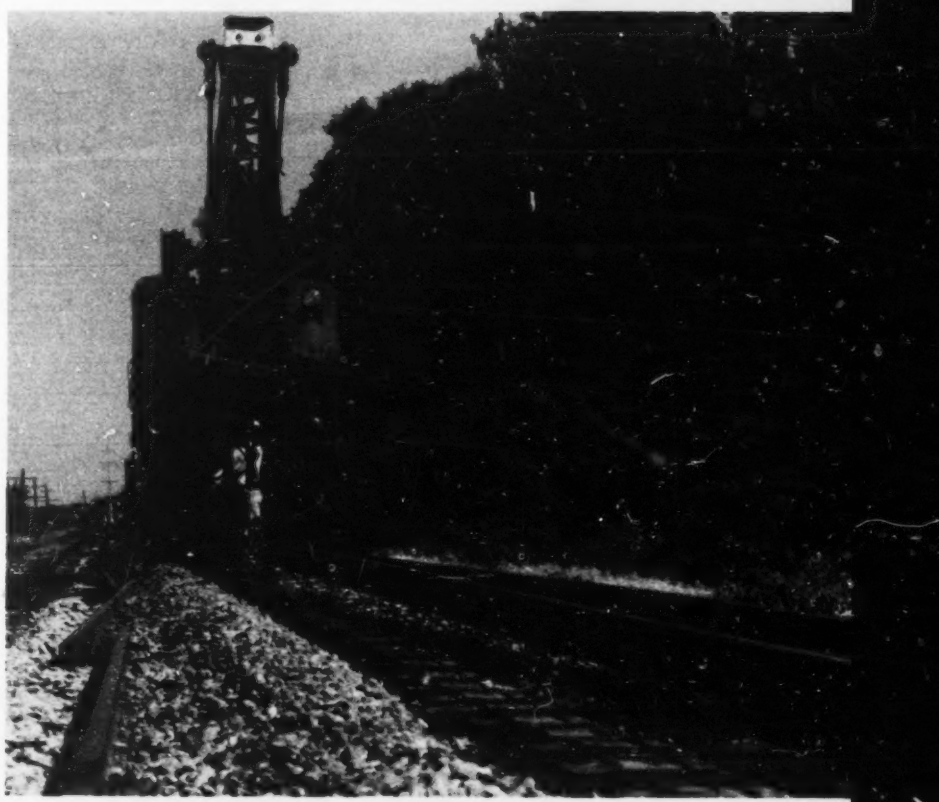
5 Inside
12 Watching Washington
16 Lines on Labor

DEPARTMENTS

48 People in the News
50 Suppliers
51 Letters
53 100 Years Ago
55 Carloadings
62 Products Report
62 New Literature
58 Professional Cards
59 Classified Advertising
61 Guide to Advertising

COVER: Putting down continuous welded rail on the Norfolk & Western.

NW finds good track pays off at the



A few weeks ago, at a meeting of financial analysts in New York, Norfolk & Western announced a 1979 net income of nearly $200 million. The only thing unusual about that announcement was the record-breaking magnitude of NW's annual earnings, for bringing a healthy figure down to the bottom line has been a consistent virtue of the Virginia-based coal road for some years.

It may be difficult to tie maintenance-of-way expenditures to profit as directly, say, as investment in specialized rolling stock or motive power. But looking at the NW record, it becomes difficult to escape the conclusion that a long-term emphasis on a high standard of track, and a consistent willingness to put a sizable investment into the machines and materials needed to provide it, have had a pretty direct bearing on NW's consistently favorable operating results. The railroad doesn't have any doubts about that at all.

"Our continuing emphasis on improving our physical plant and increasing our efficiency of operations was directly reflected in our results for the year," said NW Executive Vice President Robert B. Claytor at that analysts' meeting.

NW has traditionally operated under what might be termed a "no deferred maintenance" approach. Put another way, this means simply that the railroad regularly puts sufficient resources into its m/w program to assure that the condition of its track structure will neither adversely affect its operations nor diminish its competitive ability. "The essential objective of our maintenance-of-way program," explains NW Chief Engineer L. A. "Buck" Durham, Jr., "is to keep the railroad adequately maintained to handle the level of traffic we're carrying."

"It's much harder to catch up," adds NW's assistant chief engineer-maintenance, D. E. Turney, Jr. "The key to a successful program is to avoid getting behind. We've been able to do that."

● **Evidence of success.** How do you gauge an engineering department's success in achieving this sort of maintenance level? One way might be to look at the number of operating restrictions imposed by track condition, and here NW looks remarkably good.

"We currently have fewer slow orders on our railroad than we have ever had," NW's Don Turney told *Railway Age* in mid-February. "The main line had only 24.5 miles under slow order last week," he noted, "and most of these were relatively minor restrictions."

Another way to gauge maintenance-of-way effectiveness is to look at a railroad's safety record, and on this score, too, NW comes out looking exceptionally good. Over the five-year period from 1973 to 1977, for example, NW consistently posted one of the more favorable records of any Class I or II railroad for track-related accidents. In 1977, NW's average of track-related accidents per million train miles was less than half the national average. This record was achieved, moreover, under some of the most severe conditions of traffic and terrain to be found anywhere in the industry.

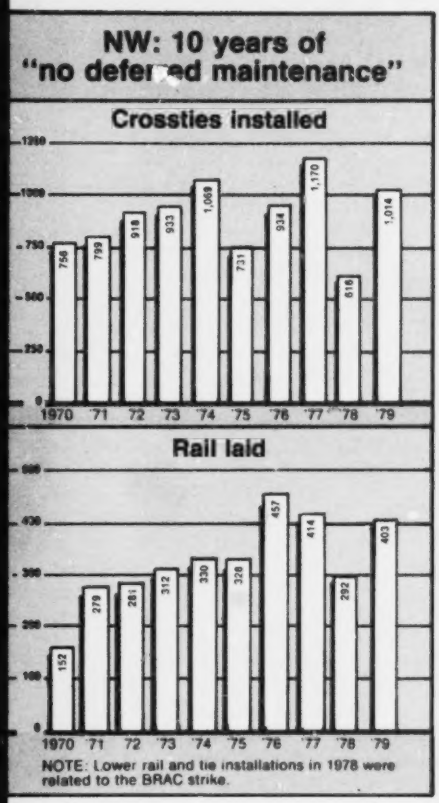
Together with these achievements in building the kind of track structure that can move shipments over the railroad safely and on time, Durham's engineering team has posted some notable gains in both the productivity of NW's maintenance-of-way forces, and their efficiency in getting on track, getting the job done, and getting off again. A Norfolk & Western system rail gang, for example, operates with 16% less manpower than it had as recently as 1972, yet it can put upwards of 30% more rail in place for each on-track hour. Similarly, today's system tie gang can put close to half again as many ties in place for each on-track hour as its 1972 counterpart. While not as dramatic as these, productivity gains in every area of NW's m/w activity have meant both direct savings in the cost of track maintenance and the less-easily identified savings in operating costs that go with reduced down time for maintenance activity.

Clearly contributing to the ability of NW's engineering forces to develop high levels of productivity and efficiency has been the year-in, year-out consistency of the railroad's maintenance-of-way budget. Over the past five years, NW's track and structures maintenance spending has hung right around a way and structures expense ratio of just over 15%, and the regularity of that budget has enabled the railroad to sustain a relatively uniform level of maintenance-of-way activity, with all of the gains in efficiency that go with that.

● **Hard wear, high standards.** Norfolk & Western does not provide an easy track maintenance environment; in fact, it may be one of the toughest proving grounds in the entire industry for m/w materials and practices.

Almost 60% of total NW tonnage is coal traffic, almost all of which now moves behind six-axle locomotives in solid trains of 100-ton hopper cars. On the railroad's principal coal routes that traffic often reaches an extraordinary density; on some of NW's West Virginia main lines, annual traffic reaches a level of nearly 70 million gross tons per mile.

bottom line



NW crosses three mountain ranges, and terrain imposes some of the railroad's most difficult maintenance problems. Some of the worst are located on those same western Virginia and West Virginia main lines that carry the railroad's heaviest tonnage. About 50% of the Pocahontas Division main line between Bluefield, Va., and Williamson, W. Va., for example, is laid on curves, several of them as sharp as 13°. Annual tonnage on portions of this line reaches as much as 67 MGT.

To successfully accommodate its heavy tonnages under these severe conditions, NW has adopted some of the highest standards for track material and construction in the industry. NW main-line track standards call for 132-pound rail carried on ties spaced at 19½ inches on centers, or 24 ties per 39-foot rail section. Continuous welded rail is standard for track up to and including 10° curves, with 78-foot butt-welded rail used on curves greater than 10°.

The railroad's standard main-line ballast section provides for an 8-inch layer of compacted subballast and a top ballast section of 15 inches of crushed stone ballast beneath the ties. A standard 6-inch ballast shoulder is extended to 12 inches on the outside of curves in welded rail territory.

The use of 132-pound rail has been standard on NW for more than 30 years, and the railroad has been laying cwr since the mid-1950s. More than 60% of the system's main-line track miles are now laid with a rail section of at least 130 pounds, and NW's welded rail in main-line track now totals some 3,600 miles.

Much of the lighter rail still in use was inherited in NW's 1964 merger with the Nickel Plate and Wabash railroads, which were typically laid with 110-, 112-, and 115-pound rail. Because of this, says Durham, "we have a good market for our reclaimed 132-pound rail."

● **Problems with rail.** Despite his system's overall high rail standard, however, Durham considers rail to be his biggest single m/w problem.

"I'm not satisfied with rail quality," says Durham. "It's not holding up under traffic." The principal problems, he believes, are developed by heavy and repetitive loads and the train-track dynamics that are characteristic of the unit trains of 100-ton hoppers that now move the bulk of NW coal traffic.

"Several years ago," says Durham, "wear governed rail replacement, but with heavier wheel loads fatigue and internal defects are now the criteria. We are also now getting plastic flow in the rail head before it work-hardens."

Assistant Chief Engineer Turney cites the example of a section of track on NW's Altavista District east of Roanoke that is subject to extremely heavy coal traffic. "Some of this section was laid with 132-pound rail in 1961 that is still good," he says, "while rail we laid in the same section during 1970-72 is up to three defects per mile per year, and we are now going to have to change some of it out.

"We feel that the 1961 rail was work-hardened with 55- and 70-ton cars, while the newer rail has not had this advantage, even though tonnage over this section has remained about the same," Turney says. "The newer rail is suffering from detail fractures due to head-checking and shelling." For curves in excess of 6° NW has adopted head-hardened rail as a standard to combat rail wear problems. Use of this rail, says Durham, has doubled the period between rail changeouts compared to experience with standard carbon rail under similar conditions of heavy tonnage and curvature.

"We also use rail oilers extensively to prolong rail life on curves," says Durham. "The proper use of flange lubricators is the single most important factor in reducing rail wear on the high side of curves," he adds, "and we are adamant that our field forces keep these lubricators in good working order." With proper use of lubricators, says Durham, some 5° curves laid with standard carbon rail have now carried as much as 300 MGT, and are expected to handle at least another 100 MGT before replacement is required.

An increase in rail corrugation, particularly in curves, is another problem that Durham attributes to heavier modern wheel loads. "We do a lot of rail grinding," comments Turney, "principally to eliminate this corrugation in curves."

"Joints in welded rail are a real problem," says Durham, and NW is curing the problem by eliminating joints as rapidly as it can. When the railroad started its cwr program in the 1950s, the rail was laid in 660-foot plant-welded strings, with jointed field connections. Strings of 1,440-foot are now laid with all joints field welded, and NW is going back and field welding joints in cwr territory that were originally bolted. "We are currently installing over 10,000 field welds each year in track to eliminate joints," says Turney, "and we now have over 50,000 field welds in service."

The use of standardized procedures for field welding, together with ultrasonic weld testing, has contributed to an extremely low field weld failure rate. For insulated joints in welded rail territory, NW has standardized on bonded epoxy joints. Recently, the railroad has begun to use all-welded turnouts, and has been using explosive hardened frogs for three years now. "Preliminary indications are that they are going to be very beneficial," says Durham. "It looks like they're going to hold up very well."

● **Lasting ties.** NW has standardized on creosoted ties of white oak, or other hardwoods, with what Durham calls excellent results. Average tie life varies anywhere from as little as 23 years under the heavy tonnage and severe service conditions of NW's Pocahontas Division to as much as 50 years in yard service, with an overall system average tie life of over 35 years.

Though still committed to wood ties, NW is currently evaluating the use of concrete ties under its severe traffic conditions. "We have a test installation of concrete ties with Pandrol fastenings in a section of track west of Roanoke that's subject to heavy coal traffic," says Durham, "and for comparison purposes we put in a section of our standard wood-tie track next to the concrete tie section. "The installation has been in for more than five years, and so far it looks all right. We've had only a few problems; two ties have broken, and there's been some insulator breakage."

But Durham isn't ready to go to concrete ties. "I'm not yet convinced of the need," he says. "We can put a timber tie, complete with hardware, in place for $29, while we estimate that concrete ties

would cost us $60 each in place, and we don't know what kind of service life we'll get under our traffic conditions. We can't afford concrete ties at the present price. As long as we can get them we'll probably stay with wood."

Durham attributes much of NW's success with wood ties to the oversized tie plates the railroad adopted in the 1940s, which have proven effective in both reducing mechanical wear of ties and in preventing gauge-widening in curves. "I believe that without the large tie plates we'd lose about 25% of our present tie life," comments Turney.

NW's standard for main-line track is a 7¾-inch by 14¾-inch tie plate, while an even larger 8-inch by 18-inch plate with a 1:40 cant is used for curves of more than 2° in track carrying more than 15 MGT annually, and on curves over 4° in territory carrying at least 8 MGT each year. To help counter the severe lateral forces of modern six-axle truck locomotives and high-tonnage cars in curves, NW has recently reduced unbalanced superelevation from 3 inches to 2 inches, and has increased its spiking pattern to provide up to five spikes per tie plate in curves of more than 6°.

The extra large plates are also placed in track for a distance of one-and-a-half rail lengths ahead of main-line crossovers in heavy traffic territory, at the end of double track, on new bridge ties, and in road crossings where tie plate cutting is a problem.

● **Granite ballasts better.** Under its heavy tonnage conditions, NW has found that granite ballast affords both improved track drainage and reduced cementing, and provides a longer track surface life.

"We've standardized on granite wherever it's available," says Durham, "but this is only on our eastern lines. In the Midwest we use a dolmitic limestone. We get the best material available, and then conduct periodic lab tests to make sure of it."

"For our subballast," adds Turney, "we use a crusher run material and compact it to seal off moisture from the clay or softer materials below."

Still another problem that NW associates with heavy unit train movements is ballast fouling. This has proved particularly troublesome on the low side of curves in heavy tonnage territory. After trying several approaches, Durham is convinced that regular ballast shoulder cleaning is the most cost effective answer to the problem. The railroad shoulder cleans about 500 miles or more of heavy tonnage track every year. Typically, two passes are made with the shoulder cleaning equipment.

Like a number of other railroads, NW has tried pressure cement grouting to stabilize troublesome areas such as road crossings or fills. "It was all right as long as it lasted," says Durham, "but it proved terribly expensive to rebuild a crossing that had been grouted."

More recently NW has tried the lime slurry method of roadbed stabilization. Another recent additon to NW's roadbed stabilization techniques is the use of a polyester engineering fabric to seal the subgrade and spread loads in troublesome areas. The railroad first tried engineering fabric on a limited basis in 1978, and began using it more extensively in 1979.

"We tried it last year for a section of about 4½ miles of track near Cleveland," says Turney. "The track had previously been lowered to improve clearances by undercutting, with no subballast, and we had a very unstable subgrade of clay, mud, and the like. We just weren't able to maintain surface. We undercut it again and removed the fouled material, placed the engineering fabric, and raised the track, with the fabric about 10 inches under the ties. We think the track is now going to hold up quite well."

NW is now also using the fabric as a standard for new and undercut switches and road crossings, as well as for subgrade trouble spots and elsewhere.

For new track construction NW has two basic approaches. Most often the railroad employes prefabricated 39-foot track panels. These are lifted into place by a locomotive crane. The joints are then staggered or replaced by welded rail strings. "For long sections of new track," says Durham, "we find the use of preplated cross ties spaced on the grade, followed by placement of cwr, to be a more efficient practice."

● **Key to NW's m/w productivity.** NW's highly mechanized production gangs are at the heart of the railroad's ability to get m/w work done rapidly, and at low cost. NW began to mechanize its track work in the early 1950s, but some of the greatest productivity gains have been made within the past decade.

The railroad has tried both on- and off-track m/w equipment, but has found that on-track machinery is much more productive in its large system gangs. "Off-track equipment is all right for maintenance ties, and other scattered work," says Durham, "but we find on-track equipment much better for our major maintenance work."

A combination of new and improved track machinery, better work methods, and tight control of labor requirements has given NW some impressive m/w productivity gains over recent years. For example, based on a constant 1979 dollar comparison, labor unit costs to install crossties improved 29% over 1972 costs. NW's production rail gangs have done even better, with a 40% improvement by this same comparison.

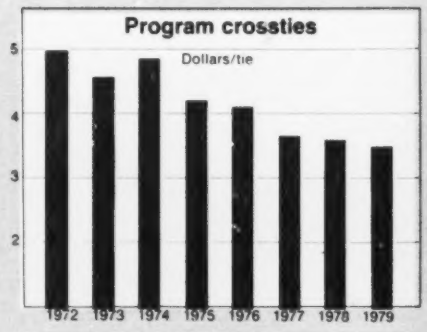
As an illustration of the significant gains that NW and the railroad industry have been able to make in track work, Durham cites the example of switch raising work with modern tampers. "Using modern tampers," he says, "we can surface and line a main-line track turnout—even a No. 20—in one hour and 20 minutes with just two people in addition to the operator and foreman. This used to take 12 to 15 people at least six hours."

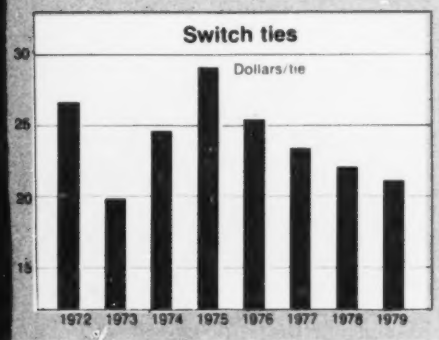
Modern track machinery, of course, gets the largest share of the credit for NW's productivity gains, but Turney also mentions such improved work methods as the use of a simple piece of equipment like a rubber-tired Pettibone crane with a magnet to pick up loose track material behind a rail gang, or the use of good time

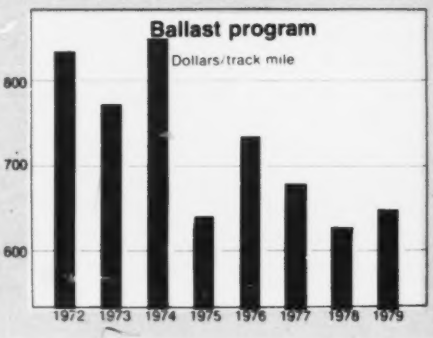
NW Chief Engineer Durham (left) with Assistant Chief Engineer-Maintenance D. E. Turney, Jr. Says Turney: "The key to a successful program is to avoid getting behind."

NW: M/w unit labor costs 1972-79

Fully allocated costs include everything from material distribution through the gang's cook and his helper to clean-up behind the gang. Costs are adjusted to 1979 dollars.







standards to trim any possible labor surplus out of a production gang.

Much of the credit for productivity improvement goes, too, to constant management attention. "NW is productivity conscious," says Turney. "Our units of production and our unit costs are looked at continuously by NW supervisors and top management."

For several years now the railroad has been using detailed productivity measures, which are tracked on a continuing basis by NW's management information system. "We're goal-oriented," says Turney. "We put them in writing every year, and these are meaningful goals that will affect the bottom line. We try to set reasonable goals for our gangs. We furnish them with weekly performance reports on every gang, and we find they're anxious to see how they perform against the others."

More formalized training, too, is becoming an important part of NW's efforts to improve m/w effectiveness and productivity. Just last year the railroad established a school to develop track foremen at its Roadway Material Yard in Roanoke. Apprentice foremen are brought in 12 at a time for a year-long program that combines a week of classroom training every 12 weeks with structured on-the-job field training in every aspect of m/w operations. "We think it's paying off handsomely," says Durham.

Extensive computer utilization is still another part of NW's drive for m/w efficiency. In addition to such traditional computer chores as m/w material inventory management, budgeting, and cost control, NW's engineering department uses the railroad's computers for such diverse tasks as managing cross-tie distribution for their annual track program, data analysis from its track geometry car, bridge rating, and analysis of rail defect history to aid development of the railroad's annual rail program.

● **The 1980 program.** The railroad is now gearing up for a 1980 m/w program that may be called fairly typical of the railroad's maintenance level of recent years. Total engineering department m/w expense is budgeted at some $186.4 million, with another $60.5 million in road projects included in NW's record 1980 capital improvement budget.

That program will include 150 track-miles of new cwr and another 161 miles of "fit" welded rail work, 800,000 ties, and over 2,000 miles of ballast work. Programmed ballast cleaning this year will total 760 miles, and rail grinding 571 miles.

Equipment spending for 1980 includes some $3.5 million in new or replacement equipment for an NW roadway machinery fleet that now represents an investment of more than $25 million. Another $2.9 million will go for new track maintenance rolling stock such as side-dump cars, Jordan spreaders, and locomotive cranes.

Beginning in April, NW will deploy four rail gangs—two on its Eastern Region, and one each on the Lake and Western regions—and eight tie gangs—four on the Eastern Region and two on each of the other two regions. A total of 19 surfacing gangs will be in operation. While the number of rail and tie gangs will equal those of the past several years, surfacing gangs have been reduced from the previous total of 21. Both the use of faster surfacing machines and an overall improvement in track condition as welded rail mileage grows, says Don Turney, have helped to reduce the need for surfacing gangs.

Careful planning and coordination between operating and engineering staffs at all levels, and beginning months ahead of time, help NW to resolve the conflict between the operational need to move traffic and the engineers' need to get large blocks of on-track time for their expensive production gangs. "For rail gangs we're usually able to get a full 8-hour possession," says Turney, "while for tie and surfacing gangs trains will be bunched as much as possible."

● **Planning and support.** Hard work at planning and coordinating sessions seems to pay off. In 1979, overall train delays for m/w activity were only about 13%, while production gangs were able to operate at an overall efficiency factor of more than 80%.

Supporting NW's field maintenance forces are two major m/w material plants. A rail welding plant at Bellevue, Ohio, with a production capacity of as many as 100,000 welds a year, is capable of meeting the railroad's normal annual welded rail requirements for both new and relay welded rail. The Roadway Material Yard at Roanoke fabricates panel track and panel turnouts, preplates ties, reclaims and rebuilds other track material.

While the bulk of its track work is performed by NW's large production gangs,

Today's tie gang can put close to half again as many ties in place as a 1972 gang.

divisional maintenance forces remain a key element of the railroad's track maintenance program. "We still believe in section gangs," says Durham. "We think they're required for day-to-day work. They average one every 25 to 30 miles, depending upon the territory, and run anywhere from three to six men. We use them for installing maintenance ties, repairing insulated joints, patching road crossings, brush cutting, material distribution, emergencies, and the like." Mechanization of track work doesn't end with the production gangs. "Each roadmaster has mechanized equipment in his territory," says Durham. "Most have an on-track crane, backhoe, air compressor, and various powered hand tools."

● **Inspection, inspection, inspection.** Fundamental to the success of Norfolk & Western's track maintenance program is inspection, inspection, and more inspection. "With our tonnages, inspection is vital," says Turney. "We couldn't survive without it."

Track inspection on NW is a multilevel process. At its most sophisticated level, track inspection is carried out by the railroad's self-propelled Plasser EM-80 track geometry car. Tolerances for a section of track are preinserted into the EM-80's onboard computer, which compares them with actual conditions for profile of both rails, gauge, cross level and superelevation, alignment of both rails, surface of both rails, and a twist value. The computer provides an immediate defect indication and produces a continuous printout that ties defects to mileposts and landmarks.

Updating improvements to the car since it went into service have added a capability to measure gauge through switches and provide a classification of defects into three levels of priority.

The EM-80 has been in service for about two and a half years now, and NW is using it to cover its principal main lines about three times each year. The car is operated at a top speed of 35 mph, and usually averages better than 130 miles of actual testing daily. In addition to a three-man operating crew, NW requires its local maintenance people to be on board when the car is in their territory, and the roadmaster gets an exception report at the end of his district. "We expect him to inspect the defects and take immediate corrective action," says Durham.

Durham is enthusiastic about the new capabilities that the track geometry car has given the railroad. "Previously all of our inspection was by eye," Durham told *RA*. "Now we *know* what we've got. It has become a major tool in our planning. We're using the results to plan our maintenance program for the next year. It tells our people if surfacing is needed, or if the superelevation needs correction. If we have a lot of gauge defects, we know we have to look closely at the crosstie situation."

NW conducts similar track geometry inspection of its branch lines with a small track inspection machine fabricated in the railroad's own shops. Towed over the track, the machine checks track gauge and cross level, and prints out the results on a tape.

NW contracts with the Sperry Rail Service for about 9,000 miles of rail testing for internal defects each year, and Durham points out the greatly increased need for this type of inspection. "Since fatigue and internal defects now govern rail replacement," he says, "this testing is more important than ever. The Sperry car results now greatly affect where we put our new rail."

Similar testing of branch-line rail is carried with a Hy-Rail van fitted with ultrasonic equipment that can test track at a speed of 4 to 8 mph.

Still another product of NW's versatile shops is a Hy-Rail van fitted with a clearance-measuring frame. Completed just a few years ago, the unit is still on its first systemwide tour to record clearances. NW expects to be able to recheck its clearances every 3 to 4 years with the unit.

Despite all of this sophisticated new inspection equipment, NW still depends heavily on its divisional maintenance people as a "first line" of track inspection, and that inspection program begins right at the section gang level. "We do a lot of inspecting," says Durham. "We get out to look at the railroad. We have section gangs inspecting by walking the railroad. They'll cover about 5 miles a week on a given territory, and all of our track will get a walking inspection at least every two months."

Track foremen and/or assistant roadmasters make regular track patrols that often exeed FRA requirements. Roadmasters are required to ride trains at frequent intervals to observe track conditions under load, and division engineers cover their territory at least once a month.

"We place a great deal of emphasis on supervisory field inspection at all levels," says Turney.

At the recent analysts' meeting, NW President and Chief Executive Officer John P. Fishwick spoke about the outlook for NW's basic coal traffic. After nearly a decade of decline from its all-time record level of 92 million tons in 1969, the railroad's coal business is on the way back up. NW's 1979 coal traffic of 82 million tons was at the highest level since 1970, and was the third-biggest year for coal in the railroad's history. In the wake of petroleum shortages and rising prices, European demand for Appalachian coal seems to be growing, Fishwick said. And as New England utility plants begin a shift from oil to coal fuel, he noted, Appalachian coal is again moving through Hampton Roads for barge shipment to New England.

NW has not yet released any projections of its coal traffic levels for the next few years, but given the worldwide shift from oil to coal, it is almost certain that NW will be hauling record levels of coal traffic by some time in the 1980s. When that traffic comes, it should be even more certain that NW's long-term emphasis on building and maintaining a first class track structure will continue to give the railroad the capability to efficiently and safely handle the business. ■

Market

CARLOADINGS

Loadings of revenue freight in the week ended Feb. 16 totaled 443,703 cars, according to the Association of American Railroads. This was an increase of 36,422 cars or 8.9%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Feb. 16 are estimated at 17.1 billion, an increase of 11.3% above the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	Feb. 16 week	Feb. 9 week
Grain	30,442	32,371
Farm products	4,734	4,741
Metallic ores	22,056	25,265
Coal	100,533	94,848
Crushed stone, gravel & sand	12,461	12,085
Nonmetallic minerals	14,072	12,689
Grain mill products	18,924	18,898
Food and kindred products	19,560	19,040
Primary forest products	20,611	20,267
Lumber & wood products (except furniture)	11,007	10,391
Pulp, paper & allied products	21,780	21,430
Chemicals & allied products	29,417	28,438
Petroleum products	6,959	6,812
Stone, clay & glass products	15,458	14,791
Coke	6,549	5,927
Metals & products	17,888	17,299
Motor vehicles & equipment	20,020	18,897
Waste & scrap materials	14,322	13,439
Forwarder & shipping assn. traffic	11,601	11,482
All other carloads	45,053	44,012
LCL traffic	256	224
Total cars loaded	**443,703**	**433,346**
Cumulative total	**1980**	**1979**
7 weeks	3,011,896	2,783,401
Estimated revenue ton-miles (billions) 7 weeks	**116.4**	**104.6**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Feb. 9 totaled 34,243 cars (1.1% above the corresponding 1979 week) and 65,200 trailers or containers (up 3.5% from 1979). Cumulative volume for the first 6 weeks of 1980 is 194,770 (up 4.4% from 1979 and 350,815 trailers or containers (up 7.3% from 1979).

● *Amtrak.*—Will spend $27 million over the next six years to rehabilitate the New Haven, Conn.-Springfield, Mass., line. The program involves work on bridges, crossings, and signals.

● *Chesapeake & Ohio.*—Awarded an issue of $14.7 million principal amount of equipment trust certificates to a syndicate headed by Merrill Lynch White Weld Capital Markets Group on a bid of 99.2966 for 12.625% obligations. The offer represented a net interest cost of 12.7818%. The trust will finance up to 80% of the $18.5-million cost of 29 3,000-hp locomotives, of which 21 will be built by Electro-Motive and eight by General Electric.

● *Conrail.*—Will spend $1 million to expand the capacity of its Coal Pier 124 in South Philadelphia by rehabilitating equipment and dredging on the north side of the pier. This will permit the handling of 3 million tons of coal expected to move through the Port of Philadelphia in 1981 (compared with 2 million tons in 1979). Conrail also plans to spend $4 million to rehabilitate the pier structure.

● *New York Metropolitan Transportation Authority.*—Awarded a $161,507 contract to Louis Klauder and Associates for drawing up specifications for 130 new m-u cars to be acquired for service on the Long Island (70) and Conrail's Hudson and Harlem lines (60). MTA Executive Director John D. Simpson said the cars will be purchased with funds made available by the $500-million Energy Conservation Through Improved Transportation Bond Act, which New York state voters approved last November. Simpson has taken the unusual step of asking riders to participate in drawing up the car specs: "MTA welcomes all suggestions from commuters using these lines to help us determine the areas where the electric cars can be improved for passenger safety and comfort. We already have received a number of suggestions from the Conrail task force of the permanent citizens advisory committee of MTA. We hope to hear from concerned Long Island groups for their input. I fully recognize that the commuters who ride the present cars every day are the true 'experts' on what improvements could be made and I would appreciate their help."

● *Railway Services Corp.*—Will assemble 500 carsets of wheels, axles, and bearings for Marine Industries of Canada. Work under the $1.5-million contract will be performed by the Auto-Train subsidiary at its Sanford, Fla., wheel shop.